上潤®
Wide Plus

ELECTROMAGNETIC FLOWMETER

Product Manual

Free technical service hotline
400-887-6339 800-858-1566

FUJIAN WIDE PLUS PRECISION INSTRUMENTS CO., LTD

Wide Plus®

CONTENTS

FUJIAN WIDE PLUS PRECISION INSTRUMENTS CO., LTD

Overview of electromagnetic flowmeter

The WP-EMF series electromagnetic flowmeter developed based on field experience at home and abroad features high durability, easy operation, stable performance, and high- and low-frequency excitation for harsh conditions. It is widely applied in flow measurement in petroleum, chemical, metallurgy, textile, paper, environmental protection, food and other industrial sectors as well as municipal management, water conservancy construction, etc.

Operating Principle

The measuring system of the sensor of the electromagnetic flowmeter is based on Faraday's law of electromagnetic induction. Two detection electrodes are available on the walls perpendicular to the axis of the measuring tube and the magnetic line of force of the magnetic field. When conductive fluid flows along the axis of the measuring tube, the magnetic line of force will be cut, leading to the induced electromotive force. Then the induced electromotive force is detected by the two electrodes on the measuring tube, which is calculated by:

$$E=KBVD$$

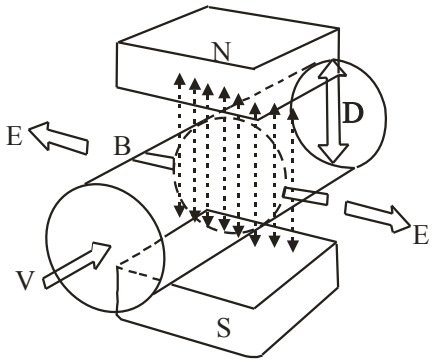
Where, E is the induced electromotive force;

K is the instrument constant;

B is the magnetic induction intensity;

V is the average flow rate within the section of the measuring tube;

D is the inner diameter of the measuring tube.



When the flow rate is measured, the conductive fluid flows through the magnetic field perpendicular to the flow direction, leading to the induced electromotive force proportional to the average flow rate. Therefore, the conductivity of the measured fluid should be higher than the minimum conductivity of the flowmeter. The induced voltage signal is detected by two electrodes. It is transmitted to the converter through a cable. Following the signal processing and related calculation, the cumulative flow and instantaneous flow are displayed on the screen of the converter.

Advanced technology

Trustworthy product

Features

1. The measuring tube contains no blocking or moving parts that may cause additional energy loss or blockage. Therefore, this flowmeter has significant energy saving effects, especially for fluid-solid measurement such as sewage, mud, ore pulp, coal water slurry, paper pulp, etc.
2. Only the lining and electrodes are exposed to the measured fluidum. That is, the lining and electrodes can be selected reasonably for high corrosion resistance and wear resistance. Accordingly, this flowmeter is suitable for measurement of chemical solutions such as strong acid and alkali solutions.
3. Low installation requirements: 5D for the front straight tube section and 2D for the rear straight tube section (D is the inner diameter of the flowmeter used).
4. The measurement accuracy is not affected by the density, viscosity, temperature, pressure and conductivity of fluid. The flowmeter is also suitable for forward/reverse flow measurement. It offers an excellent solution for accurate flow measurement.
5. Low power consumption: less than 10W.
6. The converter has high interchangeability, which meets the measurement accuracy requirements without flow calibration.

   The electromagnetic flowmeter with such advantages is used more and more widely in various industries. It is preferred in fluid flow measurement.

Technical parameters

1. Analog current output

   Load resistance: 0 ~ 1.5kΩ (0 ~ 10mA);

   0 ~ 750Ω (4 ~ 20mA).

   Basic error: 0.1% ± 10μA.

2. Frequency output

   Frequency output range: 1 ~ 5000Hz;

   Electrical output isolation: photoelectric isolation. Isolation voltage: >1000V DC

   Frequency output driver: field-effect tube output; maximum withstand voltage: 36V DC; maximum load current: 250mA.

3. Pulse output

   Output pulse equivalent: 0.001 ~ 1.000m^3/cp,

   0.001 ~ 1.000Ltr/cp.

   Output pulse width: 50ms. It automatically changes into square wave output at high frequency;

   Electrical output isolation: photoelectric isolation; isolation voltage: >1000V DC

   Pulse output driver: field-effect tube output; maximum withstand voltage: 36V DC; maximum load current: 250mA.

4. Alarm output

   Alarm output contact: ALMH-- upper limit alarm;

   ALML-- lower limit alarm;

   Electrical output isolation: photoelectric isolation. Isolation voltage: >1000V DC

   Alarm output driver: Darlington tube output; maximum withstand voltage: 36V DC; maximum load current: 250mA.

5. Communication interface and protocol

   MODBUS interface: RTU, physical interface RS-485, electrical isolation 1,000V;

   HART interface: support the standard HART protocol, with HART handheld communicator, suitable for online display of measured values and modification of meter parameters;

6. Electrical isolation

   Insulation voltage between the analog input and analog output: not less than 500V;

   Insulation voltage between the analog input and alarm power supply: not less than 500V;

   Insulation voltage between the analog input and AC power supply: not less than 500V;

   Insulation voltage between the analog output and AC power supply: not less than 500V;

   Insulation voltage between the analog output and ground: not less than 500V;

   Insulation voltage between the pulse output and AC power supply: not less than 500V;

   Insulation voltage between the pulse output and ground: not less than 500V;

   Insulation voltage between the alarm output and AC power supply: not less than 500V;

   Insulation voltage between the alarm output and ground: not less than 500V.

Ordering instructions

Before ordering, please read this document, understand the model and code requirements and determine the specific model and code as required. If necessary, please fill out the table for electromagnetic flowmeter selection on the last page.

Performance indicators of WP-EMF electromagnetic flowmeter

Integrated type II with flange

Integrated type II with clamp

Model	WP-EMF-A	WP-EMF-C
Installation	Integrated type II with flange	Integrated type II with clamp
Language	Chinese or English	Chinese or English
Diameter	DN10 ~ DN800	DN40 ~ DN200
Electrode material	316L, HB, HC, Ti, Ta, Platinum	316L, HB, HC, Ti, Ta
Lining material	PTFE, PFA, F46, chloroprene rubber (CR)	PFA, F46
Medium	Conductive fluid (solid-fluid)	Conductive fluid (solid-fluid)
Accuracy level	0.2%, 0.5%, 1.0% (DN10 ~ DN200) 0.5%, 1.0% (DN250 ~ DN800)	0.2%, 0.5%, 1.0%
Fluid conductivity	>5μS/cm (water: >20μS/cm)	>5μS/cm (water: >20μS/cm)
Excitation	Low-frequency square wave excitation; high-frequency square wave excitation (suitable for pulp measurement)	Low-frequency square wave excitation; high-frequency square wave excitation (suitable for pulp measurement)
Flow rate range	0.1 ~ 15m/s (flow unit: adjustable)	0.1 ~ 15m/s (flow unit: adjustable)
Connecting flange	GB/T9124.1-2019	GB/T9124.1-2019
Fluid temperature	-40℃ ~ +80℃	-40℃ ~ +80℃
Rated pressure	0.6MPa ~ 4.0MPa (by diameter, as detailed in the selection table)	1.0MPa ~ 4.0MPa (by diameter, as detailed in the selection table)
Protection class	IP67	IP67
Output signal	4 ~ 20mA output, frequency/pulse, alarm	4 ~ 20mA output, frequency/pulse, alarm
Communication	RS485, RS232 (optional), HART (optional)	RS485, RS232 (optional), HART (optional)
Empty pipe measurement	Empty pipe measurement without additional electrode, continuous measurement, fixed value alarm	Empty pipe measurement without additional electrode, continuous measurement, fixed value alarm
Recording	Power-off time recording: automatic recording of system power-off time to make up the missing flow rate (optional)	Power-off time recording: automatic recording of system power-off time to make up the missing flow rate (optional)
Infrared remote control	Infrared handheld keyboard (optional)	Infrared handheld keyboard (optional)
Use	Acid, alkali, water supply and drainage, food, paper pulp, ore pulp, etc.	Acid, alkali, water supply and drainage, food, paper pulp, ore pulp, etc.
Display	Flow rate, flow, percentage, cumulative flow, fault alarm	Flow rate, flow, percentage, cumulative flow, fault alarm
Power supply	AC220V 50Hz, DC24V	AC220V 50Hz, DC24V
Explosion-proof mark	Ex db ia q [ia Ga] Ⅱ C T6 Gb (optional)	Ex db ia q [ia Ga] Ⅱ C T6 Gb (optional)

Split type I with flange

Split type III with flange

Model	WP-EMF-B	WP-EMF-B
Installation	Split type I with flange	Split type III with flange
Language	Chinese or English	Chinese or English
Diameter	DN10 ~ DN2000	DN10 ~ DN2000
Electrode material	316L, HB, HC, Ti, Ta, Platinum	316L, HB, HC, Ti, Ta, Platinum
Lining material	PTFE, PFA, F46, chloroprene rubber (CR)	PTFE, PFA, F46, chloroprene rubber (CR)
Medium	Conductive fluid (solid-fluid)	Conductive fluid (solid-fluid)
Accuracy level	0.2%, 0.5%, 1.0% (DN10 ~ DN200) 0.5%, 1.0% (DN250 ~ DN2000)	0.2%, 0.5%, 1.0% (DN10 ~ DN200) 0.5%, 1.0% (DN250 ~ DN2000)
Fluid conductivity	>5μS/cm (water: >20μS/cm)	>5μS/cm (water: >20μS/cm)
Excitation	Low-frequency square wave excitation; high-frequency square wave excitation (suitable for pulp measurement)	Low-frequency square wave excitation; high-frequency square wave excitation (suitable for pulp measurement)
Flow rate range	0.1 ~ 15m/s (flow unit: adjustable)	0.1 ~ 15m/s (flow unit: adjustable)
Connecting flange	GB/T9124.1-2019	GB/T9124.1-2019
Fluid temperature	-40℃ to +80℃ chloroprene rubber (CR), -40℃ to +160℃ (PTFE)	-40℃ to +80℃ chloroprene rubber (CR), -40℃ to +160℃ (PTFE)
Rated pressure	0.6MPa ~ 4.0MPa (by diameter, as detailed in the selection table)	0.6MPa ~ 4.0MPa (by diameter, as detailed in the selection table)
Protection class	IP67, IP68	IP67, IP68
Output signal	4 ~ 20mA output, frequency/pulse, alarm	4 ~ 20mA output, frequency/pulse, alarm
Communication	RS485, RS232 (optional), HART (optional)	RS485, RS232 (optional), HART (optional)
Empty pipe measurement	Empty pipe measurement without additional electrode, continuous measurement, fixed value alarm	Empty pipe measurement without additional electrode, continuous measurement, fixed value alarm
Recording	Power-off time recording: automatic recording of system power-off time to make up the missing flow rate (optional)	Power-off time recording: automatic recording of system power-off time to make up the missing flow rate (optional)
Infrared remote control	Infrared handheld keyboard (optional)	
Use	Acid, alkali, water supply and drainage, food, paper pulp, ore pulp, etc.	Acid, alkali, water supply and drainage, food, paper pulp, ore pulp, etc.
Display	Flow rate, flow, percentage, cumulative flow, fault alarm	Flow rate, flow, percentage, cumulative flow, fault alarm
Power supply	AC220V 50Hz, DC24V	AC220V 50Hz, DC24V
Explosion-proof mark	Ex db ia q [ia Ga] Ⅱ C T6 Gb (optional)	

Split type I with clamp

Split type III with clamp

Model	WP-EMF-D	WP-EMF-D
Installation	Split type I with clamp	Split type III with clamp
Language	Chinese or English	Chinese or English
Diameter	DN40 ~ DN200	DN40 ~ DN200
Electrode material	316L, HB, HC, Ti, Ta	316L, HB, HC, Ti, Ta
Lining material	PFA, F46	PFA, F46
Medium	Conductive fluid (solid-fluid)	Conductive fluid (solid-fluid)
Accuracy level	0.2%, 0.5%, 1.0%	0.2%, 0.5%, 1.0%
Fluid conductivity	>5μS/cm (water: >20μS/cm)	>5μS/cm (water: >20μS/cm)
Excitation	Low-frequency square wave excitation; high-frequency square wave excitation (suitable for pulp measurement)	Low-frequency square wave excitation; high-frequency square wave excitation (suitable for pulp measurement)
Flow rate range	0.1 ~ 15m/s (flow unit: adjustable)	0.1 ~ 15m/s (flow unit: adjustable)
Connecting flange	GB/T9124.1-2019	GB/T9124.1-2019
Fluid temperature	-40℃ ~ +180℃	-40℃ ~ +180℃
Rated pressure	1.0MPa ~ 4.0MPa (by diameter, as detailed in the selection table)	1.0MPa ~ 4.0MPa (by diameter, as detailed in the selection table)
Protection class	IP67, IP68	IP67, IP68
Output signal	4 ~ 20mA output, frequency/pulse, alarm	4 ~ 20mA output, frequency/pulse, alarm
Communication	RS485, RS232 (optional), HART (optional)	RS485, RS232 (optional), HART (optional)
Empty pipe measurement	Empty pipe measurement without additional electrode, continuous measurement, fixed value alarm	Empty pipe measurement without additional electrode, continuous measurement, fixed value alarm
Recording	Power-off time recording: automatic recording of system power-off time to make up the missing flow rate (optional)	Power-off time recording: automatic recording of system power-off time to make up the missing flow rate (optional)
Infrared remote control	Infrared handheld keyboard (optional)	
Use	Acid, alkali, water supply and drainage, food, paper pulp, ore pulp, etc.	Acid, alkali, water supply and drainage, food, paper pulp, ore pulp, etc.
Display	Flow rate, flow, percentage, cumulative flow, fault alarm	Flow rate, flow, percentage, cumulative flow, fault alarm
Power supply	AC220V 50Hz, DC24V	AC220V 50Hz, DC24V
Explosion-proof mark	Ex db ia q [ia Ga] Ⅱ C T6 Gb (optional)	

Integrated type III with flange

Split type IV with flange

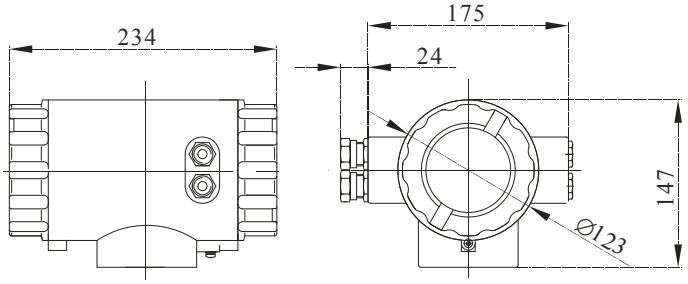
Model	WP-EMF-A	WP-EMF-B
Installation	Integrated type III with flange	Split type IV with flange
Language	Chinese or English (other languages can be customized)	Chinese or English (other languages can be customized)
Diameter	DN10 ~ DN800	DN10 ~ DN2000
Electrode material	316L, HB, HC, Ti, Ta, Platinum	316L, HB, HC, Ti, Ta, Platinum
Lining material	PTFE, PFA, F46, chloroprene rubber (CR)	PTFE, PFA, F46, chloroprene rubber (CR)
Medium	Conductive fluid (solid-fluid)	Conductive fluid (solid-fluid)
Accuracy level	0.2%, 0.5%, 1.0% (DN10 ~ DN200) 0.5%, 1.0% (DN250 ~ DN800)	0.2%, 0.5%, 1.0% (DN10 ~ DN200) 0.5%, 1.0% (DN250 ~ DN2000)
Fluid conductivity	>5μS/cm (water: >20μS/cm)	>5μS/cm (water: >20μS/cm)
Excitation	Low-frequency square wave excitation; high-frequency square wave excitation (suitable for pulp measurement)	Low-frequency square wave excitation; high-frequency square wave excitation (suitable for pulp measurement)
Flow rate range	0.1 ~ 15m/s (flow unit: adjustable)	0.1 ~ 15m/s (flow unit: adjustable)
Connecting flange	GB/T9124.1-2019 (other standards)	GB/T9124.1-2019 (other standards)
Fluid temperature	-40℃ ~ +80℃	-40℃ to +80℃ chloroprene rubber (CR), -40℃ to +160℃ (PTFE)
Rated pressure	0.6MPa ~ 4.0MPa (by diameter, as detailed in the selection table)	0.6MPa ~ 4.0MPa (by diameter, as detailed in the selection table)
Protection class	IP67	IP67, IP68
Output signal	4 ~ 20mA output, frequency/pulse, alarm	4 ~ 20mA output, frequency/pulse, alarm
Communication	RS485, RS232 (optional), HART (optional)	RS485, RS232 (optional), HART (optional)
Empty pipe measurement	Empty pipe measurement without additional electrode, continuous measurement, fixed value alarm	Empty pipe measurement without additional electrode, continuous measurement, fixed value alarm
Recording	Power-off time recording: automatic recording of system power-off time to make up the missing flow rate (optional)	Power-off time recording: automatic recording of system power-off time to make up the missing flow rate (optional)
Infrared remote control	Infrared handheld keyboard (optional)	
Use	Acid, alkali, water supply and drainage, food, paper pulp, ore pulp, etc.	Acid, alkali, water supply and drainage, food, paper pulp, ore pulp, etc.
Display	Flow rate, flow, percentage, cumulative flow, fault alarm	Flow rate, flow, percentage, cumulative flow, fault alarm
Power supply	AC220V 50Hz, DC24V	AC220V 50Hz, DC24V
Data card	Record of all operation data in more than 10 years (the data can be read via a reader)	Record of all operation data in more than 10 years (the data can be read via a reader)

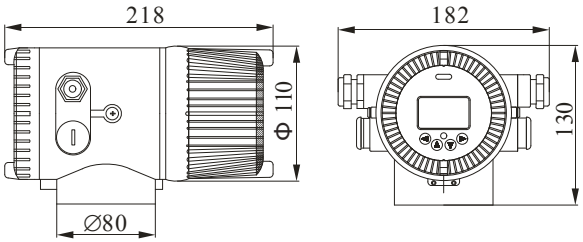
Battery type IV with flange

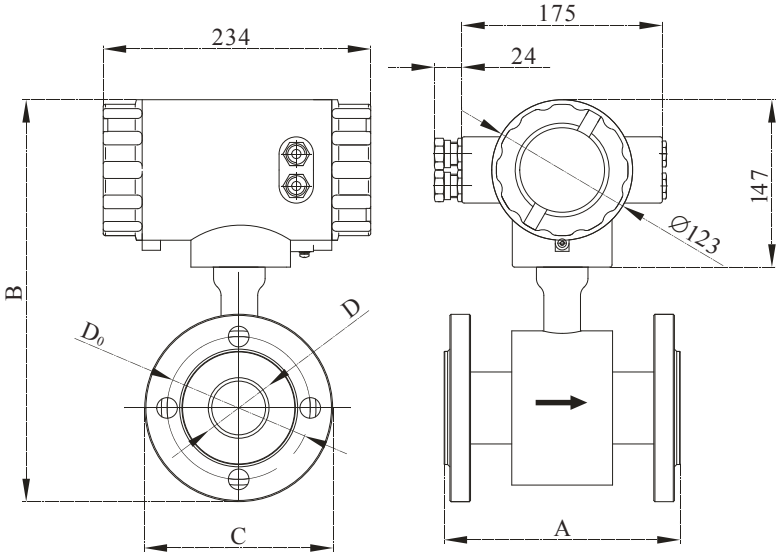
Battery type IV with flange (wireless)

Model	WP-EMF-A/B
Installation	Type VI with flange (battery-powered flowmeter)
Language	Chinese or English (other languages can be customized)
Diameter	DN10 ~ DN2000
Electrode material	316L, HB, HC, Ti, Ta, Platinum
Lining material	PTFE, PFA, F46, chloroprene rubber (CR)
Medium	Conductive fluid (solid-fluid)
Accuracy level	0.5%, 1.0%, 2.0%
Fluid conductivity	>5μS/cm (water: >20μS/cm)
Excitation	Low-frequency square wave excitation; high-frequency square wave excitation (suitable for pulp measurement)
Flow rate range	0.1 ~ 15m/s (flow unit: adjustable)
Connecting flange	GB/T9124.1-2019 (other standards)
Fluid temperature	-40℃ ~ +80℃
Rated pressure	0.6MPa ~ 4.0MPa (by diameter, as detailed in the selection table)
Protection class	IP67, IP68
Output signal	4 ~ 20mA output, pulse
Communication	RS485 (Modbus protocol), GPRS, CDMA, NB-IoT
Empty pipe measurement	Empty pipe measurement without additional electrode, continuous measurement, fixed value alarm
Recording	Power-off time recording: automatic recording of system power-off time to make up the missing flow rate (optional)
Infrared remote control	Infrared handheld keyboard (standard)
Use	Urban water supply, acid, alkali, water supply and drainage, food, paper pulp, ore pulp, etc.
Display	Flow rate, flow, pressure, heat, percentage, cumulative flow, fault alarm
Power supply	DC3.6V, DC24V, AC220V 50Hz

Outline dimensions of integrated type







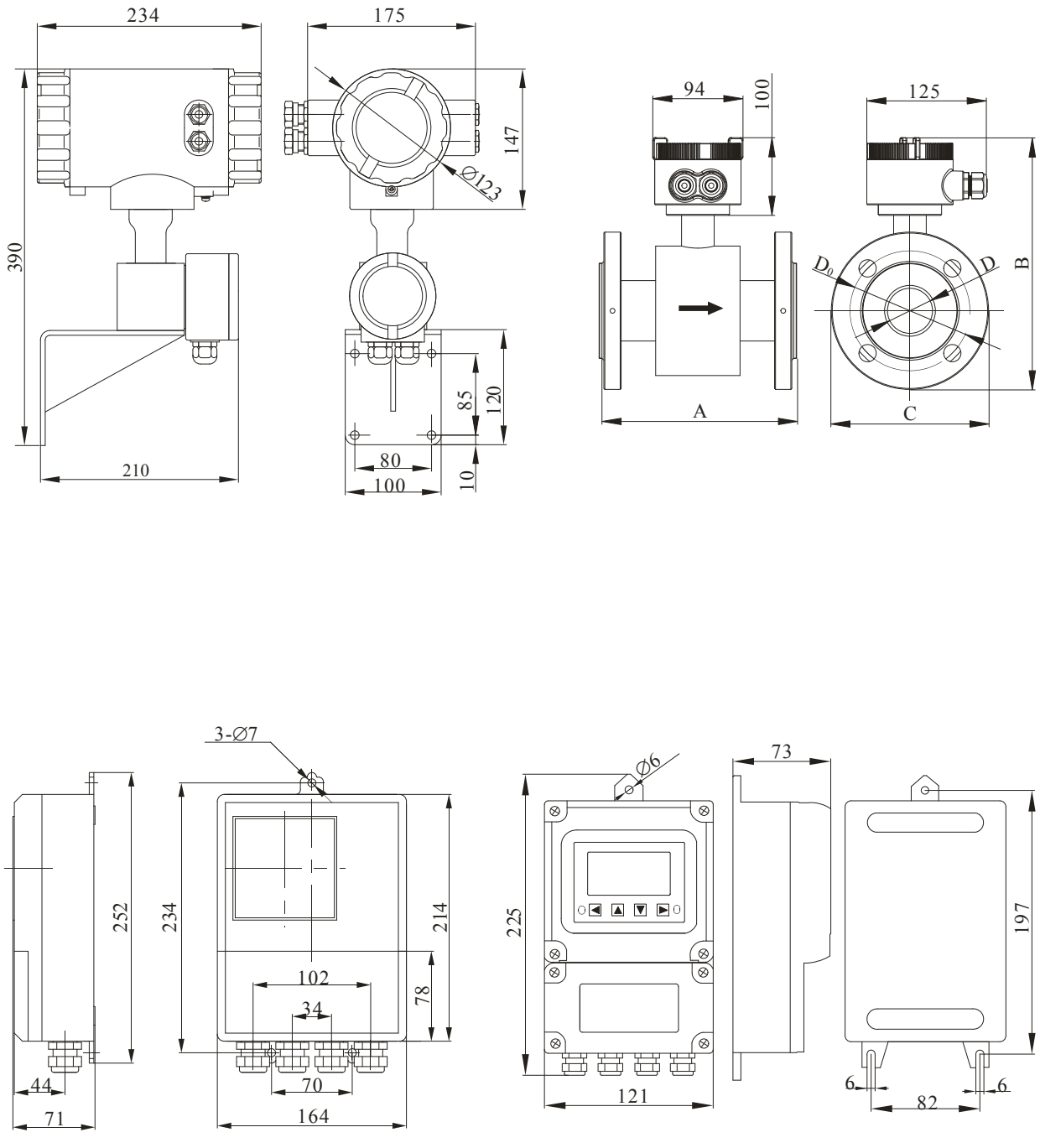
Common specifications of integrated sensor (for reference)

Diameter (mm)	Rated pressure (MPa)	Dimensions (mm)			Flange connection size (mm)			Weight (kg)
		A	B	C	D	D_0	n×Φ	
10	4.0	200	320	90	10	60	4×14	6
15	4.0	200	322	95	15	65	4×14	6
20	4.0	200	327	105	20	75	4×14	6
25	4.0	200	337	115	25	85	4×14	7
32	4.0	200	350	140	32	100	4×18	9
40	4.0	200	354	150	40	110	4×18	10
50	4.0	200	376	165	50	125	4×18	12
65	4.0	200	386	185	65	145	8×18	17
80	4.0	200	411	200	80	160	8×18	17
100	1.6	250	431	220	100	180	8×18	22
125	1.6	250	445	250	125	210	8×18	24
150	1.6	300	491	285	150	240	8×22	35
200	1.0	350	550	340	200	295	8×22	45
250	1.0	400	580	395	250	350	12×22	84
300	1.0	500	643	445	300	400	12×22	102
350	1.0	500	704	505	350	460	16×22	123
400	1.0	600	764	565	400	515	16×26	147
450	1.0	600	814	615	450	565	20×26	212
500	1.0	600	860	670	500	620	20×26	209
600	1.0	600	968	780	600	725	20×30	252
700	1.0	700	1077	895	700	840	24×30	352
800	1.0	800	1188	1015	800	950	24×35	462

Notes:1. Except for the rated pressure in the table, other pressure specifications should be customized. Please contact the manufacturer.

2. Increase the length of the rubber lining by 6 ~10mm and that of the Teflon lining by about 6mm.

Outline dimensions of split type



Common specifications of split sensor (for reference)

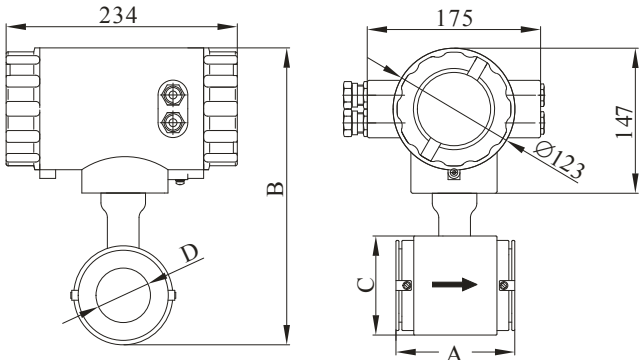
Diameter (mm)	Rated pressure (MPa)	Dimensions (mm)			Flange connection size (mm)			Weight (kg)
		A	B	C	D	D_0	n×Φ	
10	4.0	200	187	90	10	60	4×14	4
15	4.0	200	189	95	15	65	4×14	4
20	4.0	200	194	105	20	75	4×14	4
25	4.0	200	204	115	25	85	4×14	5
32	4.0	200	216	140	32	100	4×18	7
40	4.0	200	221	150	40	110	4×18	8
50	4.0	200	243	165	50	125	4×18	10
65	4.0	200	253	185	65	145	8×18	15
80	4.0	200	278	200	80	160	8×18	15
100	1.6	250	298	220	100	180	8×18	20
125	1.6	250	318	250	125	210	8×18	22
150	1.6	300	358	285	150	240	8×22	33
200	1.0	350	416	340	200	295	8×22	43
250	1.0	400	490	395	250	350	12×23	82
300	1.0	500	510	445	300	400	12×23	100
350	1.0	500	571	505	350	460	16×23	121
400	1.0	600	631	565	400	515	16×26	145
450	1.0	600	681	615	450	565	20×26	210
500	1.0	600	730	670	500	620	20×26	207
600	1.0	600	836	780	600	725	20×30	250
700	1.0	700	944	895	700	840	24×30	350
800	1.0	800	1055	1015	800	950	24×35	460
900	1.0	900	1170	1115	900	1050	28×35	550
1000	1.0	1000	1280	1230	1000	1160	28×35	680
1200	0.6	1200	1460	1405	1200	1340	32×35	770
1400	0.6	1400	1823	1524	1400	1560	36×36	1230
1600	0.6	1600	2033	1726	1600	1760	40×36	1550
1800	0.6	1800	2227	1926	1800	1970	44×39	2080
2000	0.6	2000	2428	2170	2000	2180	48×42	2600

Notes:1. Except for the rated pressure in the table, other pressure specifications should be customized. Please contact the manufacturer.

2. Increase the length of the rubber lining by 6 ~10mm and that of the Teflon lining by about 6mm. For the split type, the junction box is installed in the converter position, while the converter is separately installed on a wall or bracket.

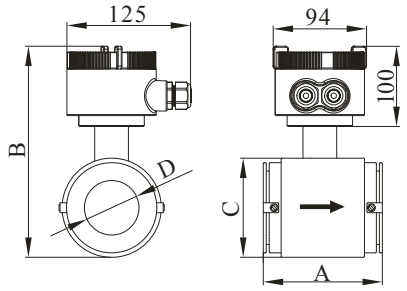
Common specifications of clamp type sensor (for reference)

Integrated type



Diameter (mm)	Rated pressure (MPa)	Outline dimensions				Weight (kg)
		A	B	C	D	
40	4.0	80	315	85	40	3.0
50	4.0	100	330	100	50	3.6
65	4.0	120	350	120	65	4.5
80	4.0	120	362	132	80	5.2
100	1.6	150(204)	386	156	100	7.0
125	1.6	150	415	186	125	9.6
150	1.6	175	443	213	150	12.8
200	1.0	200	498	268	200	22

Split type



Diameter (mm)	Rated pressure (MPa)	Outline dimensions				Weight (kg)
		A	B	C	D	
40	4.0	80	187	85	40	3.0
50	4.0	100	202	100	50	3.6
65	4.0	120	222	120	65	4.5
80	4.0	120	234	132	80	5.2
100	1.6	150(204)	258	156	100	7.0
125	1.6	150	288	186	125	9.6
150	1.6	175	315	213	150	12.8
200	1.0	200	370	268	200	22

Notes:1. Except for the rated pressure in the table, other pressure specifications should be customized. Please contact the manufacturer.

2. Increase the length of the rubber lining by 6 ~10mm and that of the Teflon lining by about 6mm. For the split type, the junction box is installed in the converter position, while the converter is separately installed on a wall or bracket.

Specification Table of WP-EMF-A/B Flange Type Electromagnetic Flowmeter

Model	Structural Type
WP-EMF-A	Integrated flange type electromagnetic flowmeter
WP-EMF-B	Split flange type electromagnetic flowmeter (standard cable: 10m)
Code	**Diameter**
( )	DN10 to DN2000 (represented by numbers)
Code	**Electrode**
1	Stainless steel (316L)
2	Hastelloy B (HB)
3	Hastelloy C (HC)
4	Platinum (Pt)
5	Titanium (Ti)
6	Tantalum (Ta)
9	Others
Code	**Lining material**
A	Chloroprene rubber (CR)
B	Polyurethane rubber (PU)
C	Tetrafluoroethylene (PTFE, F4)
D	Soluble polytetrafluoroethylene (PFA) (negative pressure resistance)
E	Polyperfluorinated ethylene propylene (F46) (negative pressure resistance)
Y	Others
Code	**Operating pressure**
1	4.0MPa (diameter: DN10 to DN80)
2	1.6MPa (diameter: DN100 to DN150)
3	1.0MPa (diameter: DN200 to DN1000)
4	0.6MPa (diameter: DN1200 to DN2000)
5	Others
Code	**Grounding ring**
A	None
B	Ordinary grounding ring (316L)
C	Grounding ring with collar (316L)
D	Ground electrodes (3 electrodes)
Y	Others
Code	**Protection class**
B	IP67
C	IP68 (for split type only)
Code	**Output mode**
0	No output
1	4 ~ 20mA frequency/pulse
Code	**Communication mode**
0	No communication
1	RS485 (standard)
2	RS232
3	HART
4	GPRS
5	NB-IoT

Specification Table of WP-EMF-A/B Flange Type Electromagnetic Flowmeter (continued)

Code	Power supply
T	AC220V 50Hz
W	DC24V
B	Battery
Y	Others
Code	**Precision**
4	0.2
5	0.5
6	1.0
Code	**Converter type**
2	Integrated type II
3	Split type I
6	Split type III
7	Integrated type III
8	Battery type IV
9	Split type IV
Code	**Function type**
S	Ordinary type (this can be omitted)
D	Flameproof and intrinsically safe type (Ex db ia q [ia Ga] Ⅱ C T6 Gb)
H	Calorimeter
M	Pulp type
Code	**Maximum flow rate**
( )	Indicate the maximum flow rate in m^3/h in parentheses
Example	**WP-EMF-A(100)1A2AB11T52D(80)**

Specification Table of WP-EMF-C/D Clamp Type Electromagnetic Flowmeter

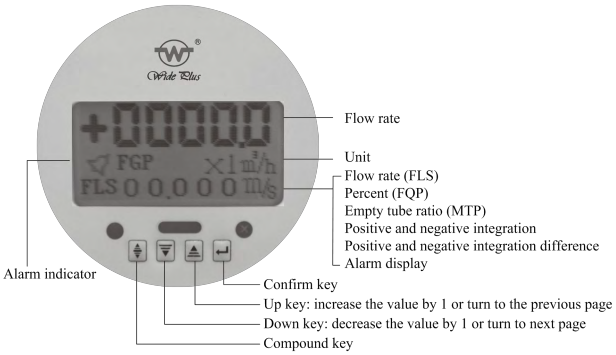
Model	Structural Type
WP-EMF-C	Integrated clamp type electromagnetic flowmeter
WP-EMF-D	Split clamp type electromagnetic flowmeter (standard cable: 10m)
Code	**Diameter**
( )	DN10 to DN200 (represented by numbers)
Code	**Electrode**
1	Stainless steel (316L)
2	Hastelloy B (HB)
3	Hastelloy C (HC)
5	Titanium (Ti)
6	Tantalum (Ta)
9	Others
Code	**Lining material**
D	Soluble polytetrafluoroethylene (negative pressure resistance) (PFA)
E	Polyperfluorinated ethylene propylene (negative pressure resistance) (F46)
Code	**Operating pressure**
1	4.0MPa (diameter: DN40 to DN80)
2	1.6MPa (diameter: DN100 to DN150)
3	1.0MPa (diameter: DN200)
4	Others
Code	**Grounding ring**
A	None
B	Ordinary grounding ring (316L)
C	Grounding ring with collar (316L)
Y	Others
Code	**Protection class**
B	IP67
C	IP68 (for split type only)
Code	**Output mode**
0	No output
1	4 ~ 20mA frequency/pulse (not suitable for the battery powered flowmeter)
Code	**Communication mode**
0	No output
1	RS485 (standard)
2	RS232
3	HART
4	GPRS
5	NB-IoT
Code	**Power supply**
T	AC220V 50Hz
W	DC24V
B	(Battery-powered)
Code	**Precision**
4	0.2
5	0.5
6	1.0

Specification Table of WP-EMF-C/D Clamp Type Electromagnetic Flowmeter (continued)

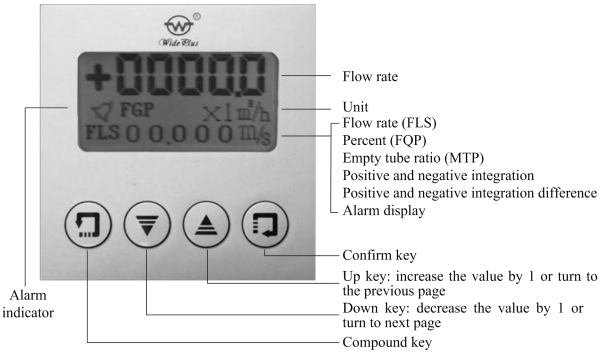
Code	Converter type
2	Integrated type
3	Split type I
6	Split type III
Code	**Function type**
S	Ordinary type (this can be omitted)
D	Flameproof and intrinsically safe type (Ex db ia q [ia Ga] ⅡC T6 Gb)
H	Calorimeter
M	Pulp type
Code	**Maximum flow rate**
( )	Indicate the maximum flow rate in m^3/h in parentheses
Example	**WP-EMF-C(100)1D2AB11T52D(80)**

Keyboard definition and terminal designation

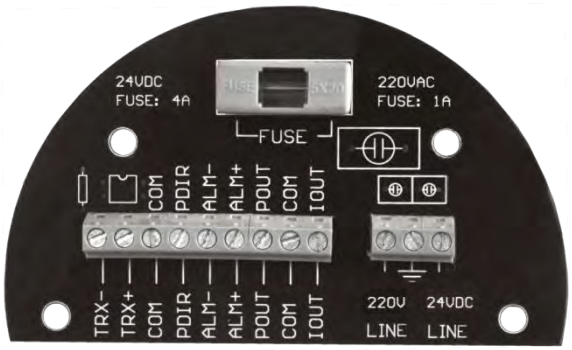
Keyboard definition and LCD screen of integrated and split type I



Keyboard definition and LCD screen of split type III



Terminal wiring and designation of integrated and split type I



IOUT: Flow current output

COM: Current output grounding

POUT: Two-way flow frequency (pulse) output

COM: Frequency (pulse) output grounding

ALM-: Lower limit alarm output

ALM+: Upper limit alarm output

COM: Alarm output grounding

TRX＋: Communication input

FUSE: Input power fuse

TRX－: Communication input

LINE: 220V (24V) power input

TCOM: 232 communication grounding

I+: Flow current output

COM: Current output grounding

P+: Two-way flow frequency (pulse) output

COM: Frequency (pulse) output grounding

AL: Lower limit alarm output

AH: Upper limit alarm output

COM: Alarm output grounding

T－: Communication input

T＋: Communication input

L2: 220V (24V) power input

G: RS232 communication grounding

COM: Alarm output grounding

L1: 220V (24V) power input

FUSE: Input power fuse

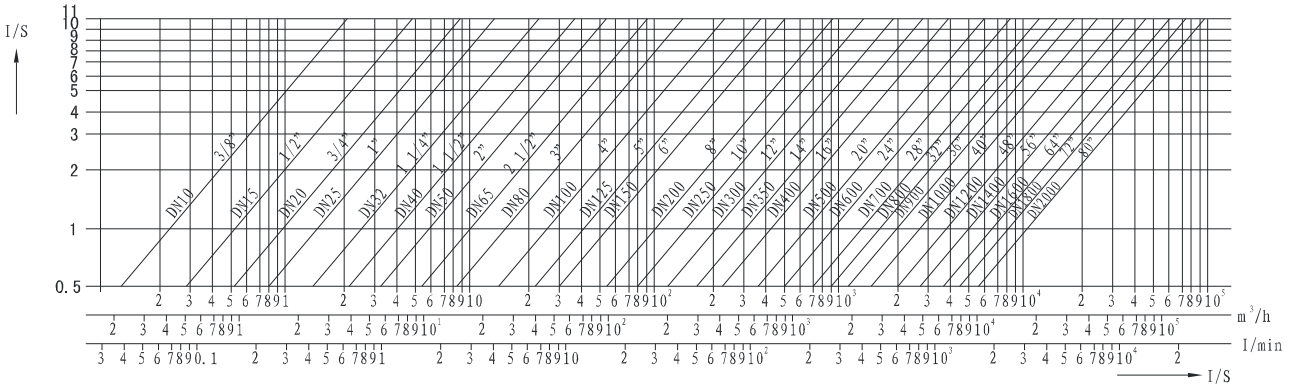
Terminal wiring and designation of split type III

SIG1	Signal 1	Connection to split sensor
SGND	Signal grounding	
SIG2	Signal 2	
DS1	Excitation shield 1	
DS2	Excitation shield 2	
EXT+	Excitation current +	
EXT-	Excitation current -	
VDIN	Two-wire 24V current contact	Analog current output
IOUT	Analog current output	
ICOM	Analog current output grounding	
POUT	Flow frequency (pulse) output	Frequency or pulse output
PCOM	Frequency (pulse) output grounding	
ALMH	Upper limit alarm output	Two alarm outputs
ALML	Lower limit alarm output	
ACOM	Alarm output grounding	
TRX+	Communication input	Communication input
TRX-	Communication input	
TCOM	232 communication grounding	

Note: In case of any changes in the above contents, please refer to the corresponding manual.

Rules for WP-EMF series electromagnetic flowmeter selection

Diameter, flow rate and flow curves of the flowmeter



Flow selection reference

Diameter (mm)	Flow Rate (m^3/h)
10	0.16, 0.2, 0.25, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0, 1.2, 1.6, 2.0, 2.5
15	0.4, 0.5, 0.6, 0.8, 1.0, 1.2, 1.6, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0
20	0.6, 0.8, 1.0, 1.2, 1.6, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12.0
25	1.0, 1.2, 1.6, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12, 16
32	1.6, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12, 16, 20, 25
40	2.5, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12, 16, 20, 25, 30, 40
50	4.0, 5.0, 6.0, 8.0, 10.0, 12, 16, 20, 25, 30, 40, 50, 60
65	6.0, 8.0, 10.0, 12, 16, 20, 25, 30, 40, 50, 60, 80, 100, 120
80	10, 12, 16, 20, 25, 30, 40, 50, 60, 80, 100, 120, 160
100	16, 20, 25, 30, 40, 50, 60, 80, 100, 120, 160, 200, 250
125	25, 30, 40, 50, 60, 80, 100, 120, 160, 200, 250, 300, 400
150	40, 50, 60, 80, 100, 120, 160, 200, 250, 300, 400, 500, 600
200	60, 80, 100, 120, 160, 200, 250, 300, 400, 500, 600, 800, 1000
250	100, 120, 160, 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1600
300	160, 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1600, 2000, 2500
350	200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1600, 2000, 2500, 3000
400	250, 300, 400, 500, 600, 800, 1000, 1200, 1600, 2000, 2500, 3000, 4000
450	300, 400, 500, 600, 800, 1000, 1200, 1600, 2000, 2500, 3000, 4000, 5000
500	400, 500, 600, 800, 1000, 1200, 1600, 2000, 2500, 3000, 4000, 5000, 6000
600	600, 800, 1000, 1200, 1600, 2000, 2500, 3000, 4000, 5000, 6000, 8000, 10000
700	800, 1000, 1200, 1600, 2000, 2500, 3000, 4000, 5000, 6000, 8000, 10000, 12000
800	1000, 1200, 1600, 2000, 2500, 3000, 4000, 5000, 6000, 8000, 10000, 12000, 16000
900	1200, 1600, 2000, 2500, 3000, 4000, 5000, 6000, 8000, 10000, 12000, 16000, 20000
1000	1600, 2000, 2500, 3000, 4000, 5000, 6000, 8000, 10000, 12000, 16000, 20000, 25000
1200	2500, 3000, 4000, 5000, 6000, 8000, 10000, 12000, 16000, 20000, 25000, 30000
1400	3000, 4000, 5000, 6000, 8000, 10000, 12000, 16000, 20000, 25000, 30000, 40000, 50000
1600	4000, 5000, 6000, 8000, 10000, 12000, 16000, 20000, 25000, 30000, 40000, 50000, 60000
1800	5000, 6000, 8000, 10000, 12000, 16000, 20000, 25000, 30000, 40000, 50000,60000
2000	6000, 8000, 10000, 12000, 16000, 20000, 25000, 30000, 40000, 50000, 60000,80000,100000

Precautions

Proper selection is a prerequisite for the correct use of the electromagnetic flowmeter. Take into account the process, physical and chemical properties of fluid, conditions of installation and use and other factors, so that the structure, diameter, flow range, lining and electrode materials, installation conditions, output signal and other parameters of the electromagnetic flowmeter meet the measurement requirements. The following should be considered for proper and reasonable use of the flowmeter.

Flowmeter diameter and range selection

First, determine the diameter and measurement range of the flowmeter. That is, determine the flow rate range of fluid inside the measuring tube of the sensor. The measurement range is crucial to the reliability and accuracy of the flowmeter. The full range should be applied when the flow rate is lower than the expected maximum value. Under normal circumstances, the flow rate is preferably less than 50% of the full range in order to improve the measurement accuracy.

The sensor diameter is usually the same as or slightly smaller than that required in the process. Given the flow, the sensor diameter depends on the measured fluid and the flow rate inside the measuring tube of the sensor. For the electromagnetic flowmeter, the flow rate of the measured fluid may be high according to the measurement principle, up to 10m/s in some applications, Considering the relationship between the flow rate and head loss of fluid inside the tube, however, the flow rate should be 2 ~ 4m/s. In special cases, it should be determined based on specific conditions. For example, it is usually 3m/s or less for fluids containing the particles that may cause tube wall wear; or 2m/s or above for fluids that may be easily adhered to the tube wall. During the paper pulp measurement, the flow rate may be increased to more than 4m/s so that fibers attached onto the electrodes are removed automatically.

Once the flow rate is determined, the sensor diameter can be calculated as follows.

$$V=353.678\frac{Q}{d^2}\ \text{(m/s)}$$

Where, d is the sensor diameter (mm), and Q is the volume flow rate (m^3/s).

When the flow rate of fluid inside the tube is 0.3m/s to 12m/s, the sensor diameter should be the same as the diameter of the process pipe to be connected. This is conducive to installation without any reducer. The flow rate is low at the beginning of a new project and high at the later stage. In this case, the full range can be adjusted to adapt to site conditions instead of flowmeter replacement. See the curves for the relationship of the flow, flow rate and diameter.

The sensor diameter should be different from the diameter of the process pipe to be connected in the following cases.

A. The flow rate in the pipe is low, but the process flow rate is stable. To meet the flow rate requirements, the local flow rate should be adjusted. In this case, the sensor diameter should be smaller than the process pipe diameter, and reducers should be applied in front of and behind the sensor.

B. In terms of costs, large-diameter electromagnetic flowmeters are more expensive. If the flow rate in the pipe is low and the process parameters are stable, a small-diameter sensor may be used to ensure proper operation and reduce investment costs.

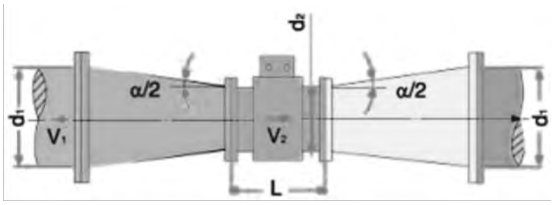
Pressure selection

Typically, the Teflon lining is not used during the flow measurement of negative-pressure fluids. If there are special requirements for the Teflon lining, the negative pressure must be described so that appropriate process measures are taken to the Teflon lining. Other linings of sensors are suitable under negative pressure.

Precautions for reducer installation

A. Taper angle of reducer

In order to reduce the impact of the reducer on the flow field distribution and avoid its impact on the accuracy of the electromagnetic flowmeter, the central taper angle (α) of the reducer should be 15° or less, so that the reducer is deemed as part of a straight pipe section. The smaller the central taper angle, the better effects.



Example: ξ value at α=8°

d_1/d_2	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
ξ_1	0.018	0.023	0.0255	0.028	0.03	0.0308	0.0315	0.0323	0.0332
ξ_3	0.01	0.02	0.07	0.15	0.26	0.43	0.64	0.9	1.25

B. Pressure loss arising from reducer

The total pressure loss consists of the following:

Pressure loss in the reducing tube: $\triangle P_1=\frac{\rho}{2}\ \xi_1 V_1^2$

Pressure loss in the divergent tube: $\triangle P_3=\frac{\rho}{2}\ \xi_3 V_1^2$

Pressure loss in the measuring tube of the sensor: $\triangle P_2=\frac{\rho}{2}\ \xi_2 V_2^2$

The total pressure loss is:

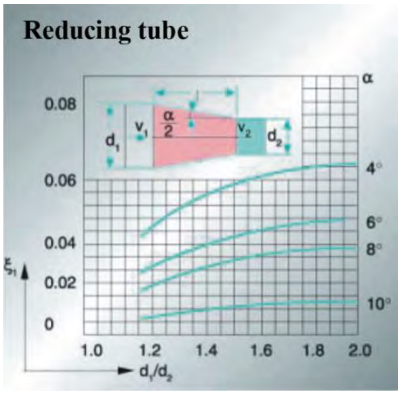
$$\triangle P=0.01(\triangle P_1+\triangle P_2+\triangle P_3)(\text{mbar})$$

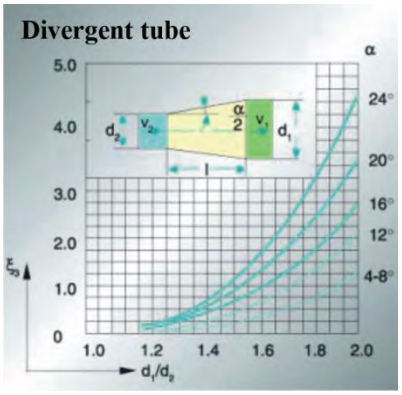
Where, ρ is the fluid density, in kg/m^3.

ξ_1 and ξ_3 are the coefficients related to Reynolds number for the reducing tube and divergent tube, respectively.

$\xi_2 = 0.02$ is the coefficient of the measuring tube of the sensor.

V_1 and V_2 are the flow rates in the process pipe and measuring tube respectively, in m/s.





Electrode material selection

Users should select the electrode material based on the corrosion of the measured fluid. Refer to the corrosion resistance in the manual for general fluids. Conduct coupon corrosion tests for complex fluids such as mixed acids.

Electrode material	Corrosion Resistance
Acid-resistant steel (1Cr18Ni9Ti)	High corrosion resistance to nitric acid, cold phosphoric acid and other inorganic acids, salt and alkali solutions, organic acids, seawater, etc. Poor chemical stability in sulfuric acid, hydrochloric acid, hydrofluoric acid, boiling formic acid, oxalic acid and industrial chromic acid, sodium carbonate, chlorine, bromine, iodine, etc. It is therefore suitable for non-corrosive or weakly corrosive fluids, such as water, sewage, ore pulp, mud, fiber pulp, syrup, etc.
Molybdenum-containing stainless steel OCr18Ni12Mo2Ti	High corrosion resistance to nitric acid, sulfuric acid (< 5% at room temperature), boiling phosphoric acid, formic acid, alkali solution, sulfuric acid under certain pressure, seawater, acetic acid, etc. It is widely applied in petrochemical, urea, Vinylon, etc.
Hastelloy B (HB)	High corrosion resistance to hydrochloric acids at various concentration levels below the boiling point, and certain corrosion resistance to non-oxidizing acids, alkalis and salts such as sulfuric acid, phosphoric acid, hydrofluoric acid and organic acid.
Hastelloy C (HC)	Corrosion resistance to oxidizing acids, such as nitric acid, chromic acid, sulfuric acid and mixed acids, as well as oxidizing salts, such as Fe++, Cu++ or oxidants, such as argonate solution and grease above the normal temperature.
Titanium (Ti)	Corrosion resistance to grease, chlorides and subchlorinated salts, oxidizing acids (including fuming sulfuric acid and nitric acid), organic acids, alkalis, etc. No corrosion resistance to pure reducing acids (such as sulfuric acid, hydrochloric acid). The corrosion resistance will drop in the presence of hydrogenating agents in acids.
Tantalum (Ta)	High corrosion resistance, similar to that of glass. It is resistant to corrosion of almost all chemicals except hydrofluoric acid, fuming sulfuric acid and alkali.
Platinum (Pt)	Suitable for almost all chemicals, but not for aqua regia and ammonium salts.

Lining material selection

Select the lining material based on the corrosion, wear and temperature of measured fluids. Chloroprene rubber is resistant to general weak acid and alkali corrosion. It is also resistant to high temperature up to 80℃ and wear. Teflon is resistant to almost all strong acid and alkali corrosion (except for hot phosphoric acid), and high temperature up to 180℃, but without wear resistance. Polyurethane rubber has high wear resistance but no acid and alkali corrosion resistance. Due to poor heat resistance, it is suitable for fluids below 65℃.

Properties and applications of common lining materials

Lining material	Main Properties	Application
Tetrafluoroethylene (PTFE, F4)	1. It has the most stable chemical properties among plastics, with resistance to boiling hydrochloric acid, sulfuric acid, nitric acid and aqua regia, as well as concentrated alkali and organic solvents. 2. Poor wear resistance and bonding performance.	1. Long-term operating temperature of the flowmeter: -40℃ to +180℃ 2. Acid, alkali and other corrosive fluids 3. Sanitary fluids
Polyperfluorinated ethylene propylene (F46)	1. Corrosion resistance equivalent to that of PTFE. 2. High bonding performance for metals, better wear resistance than that of PTFE. 3. High bonding performance for metals.	Same as PTFE.
Soluble polytetrafluoroethylene (PFA)	1. Its chemical stability, electrical insulation, lubricity, non-viscosity and non-flammability are similar to those PTFE, but its strength and aging resistance are higher than those of PTFE. 2. High bonding performance for metals, higher wear resistance than that of PTFE and F46. 3. Low smoke, flame retardance, high temperature resistance and high-temperature mechanical strength twice higher than that of PTFE.	1. Long-term operating temperature of the flowmeter: -40℃ to +260℃ 2. Acid, alkali and other corrosive fluids 3. Sanitary fluids
Chloroprene rubber (CR)	1. Excellent elasticity, breaking tenacity and wear resistance. 2. Corrosion resistance to common low-concentration acid, alkali and salt, but no corrosion resistance to oxidizing fluids.	1.＜80℃ 2. Testing is required for water, sewage, mud and ore pulp.
Polyurethane rubber (PU)	1. Excellent wear resistance (ten times that of natural rubber). 2. Poor acid and alkaline resistance.	1.＜65℃ 2. Medium wear resistance to ore pulp, coal pulp and mud.

Selection of protection level

According to the national standard GB/T4208-2017 and IEC standard (IEC60529:2001), the enclosure protection level is:

IP67 (waterproof): the flowmeter can be immersed in water for a short time. During the test, the highest point of the enclosure should be kept at least 150mm underwater while the lowest point at least 1,000mm for min. 30min. IP68 (submersible): the flowmeter should be suitable for long-term use in water, with the maximum immersion depth determined through consultations with the manufacturer.

The protection level should be selected according to the above requirements and actual conditions. IP68 applies if the flowmeter is used underground, susceptible to flooding; and IP67 applies if the flowmeter is used on the ground.

Selection of grounding ring

A grounding ring is required (ordinary or PVC type) is an insulated pipe (relative to the measured fluidum) is connected. It should be compatible with the corrosion of the measured fluidum.

If an abrasive medium is measured, a neck type grounding ring should be used to protect the inlet and outlet lining and extend the service life.

Selection of cable length

The sensor and converter are connected through a dedicated multi-shielded cable, as indicated by the cable length in the model and specification table. Its length is related to the conductivity of the measured fluidum, up to 5 times the minimum conductivity but typically no more than 100m (please contact the manufacturer for longer cables). Under normal circumstances, the connecting cable between the sensor and converter is protected in an iron tube.

Cable extension is prohibited. If the cable is broken unexpectedly or needs to be extended, please contact the manufacturer.

Precautions for cabling (split type)

1. The input signal cable of the converter must be separately laid in a steel tube that is grounded.
2. The signal cable and excitation cable shall not be parallel to other cables such as motor, transformer and other power cables. Instead, they shall be kept at least 1m away.
3. Signal cables and the excitation cables must not be disconnected or in an open circuit in the middle, or extended by welding or other means.
4. Excitation terminals must not be short-circuited or connected to any loads other than the sensor excitation coil.
5. Power cables and output signal cables shall be connected through rubber sleeves with an outer diameter of 100.5mm (provided by the customer).
6. Heavy-duty threaded pipes, seamless steel pipes and welded steel pipes conforming to the standard GB/T 14823.1 can be used as conduits, which are connected by at least 5 threads to connectors.

Precautions for sensor installation

Sensor grounding

As the detection electrodes receive very weak flow signals, the electromagnetic flowmeter is affected greatly by external interference. Proper grounding is largely decisive for the measurement accuracy and stability of the flowmeter. Since the measured fluid itself is a kind of electrolyte conductor, other unrelated electromagnetic interference must be excluded. Typically, the flowmeter is installed on a metal pipe that is connected to the sensor and ground. If the sensor is connected through a pipe with an inner insulation layer or a non-metallic pipe, grounding rings shall be used on both sides of the sensor.

1. Type of grounding ring

A. Ordinary or PVC grounding ring

Material: adjustable

Thickness: 5mm ~ 12mm

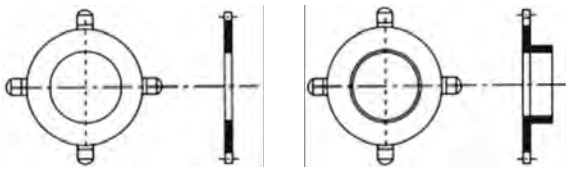
The PTFE-lined sensor is secured on the flange via screws to prevent the PTFE flange from damage.

B. Neck type grounding ring

Material: adjustable

Thickness: 5mm

The neck grounding ring is suitable for wearing fluids, such as mud, ore pulp, coal water slurry, etc. It can protect the end lining of the measuring tube and extend the sensor life. It shall be ordered together with the flowmeter. Otherwise, the flowmeter accuracy may be affected in the absence with the grounding ring.

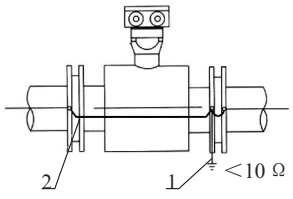


A. Ordinary or PVC grounding ring

B. Neck type grounding ring

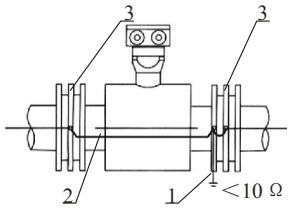
2. Grounding

A. Sensor installation on a metal pipe: the metal pipe should have no inner insulation. It should be grounded as shown below.



1. Grounding cable (required in the presence of large external interference)
2. Flowmeter grounding cable (supplied along with the flowmeter)

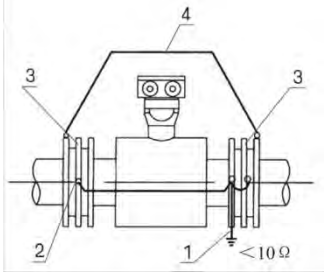
B. Sensor installation on a plastic pipe or a pipe with insulating coating or paint: grounding rings (or short tubes with grounding wires) shall be installed at two ends of the sensor, to short circuit the measured fluid and ground and ensuring zero potential. Otherwise, the electromagnetic flowmeter cannot work properly.



1. Grounding cable (required in the presence of large external interference)
2. Flowmeter grounding cable (supplied along with the flowmeter)
3. Grounding flange or ring

Sensor installation on cathodic protection pipe

Sensor installation on cathodic protection pipe: Due to potential differences between the cathodic protection pipe and ground, the measured fluid has high common mode ground potential. Therefore, grounding rings must be used for the sensor.



1. Grounding cable (required in the presence of large external interference)
2. Flowmeter grounding cable (supplied along with the flowmeter)
3. Grounding flange or ring: insulated from the flange of the connected pipe
4. Connecting cable: copper-core cable (16mm^2) , isolating the sensor from cathodic protection potential.

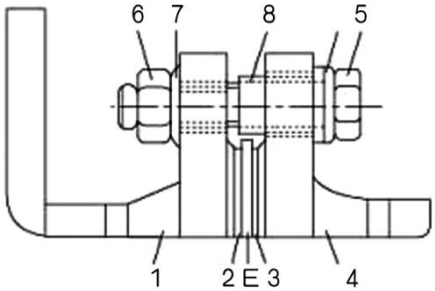
Note:

(1) Grounding rings are installed at two ends of the sensor, which must be insulated from the flange of the connected pipe. They are connected to the sensor through the flowmeter grounding cable 2 ad made of corrosion-resistant materials. The standard material specified by the manufacturer is stainless steel 1Cr18Ni9Ti.

(2) The flanges of the connected pipes on both sides of the flowmeter are connected to the sensor through copper cables (16mm^2) to isolate the sensor from cathodic protection potential.

The pipes subject to cathodic corrosion protection are insulated from the sensor. Precautions for installation:

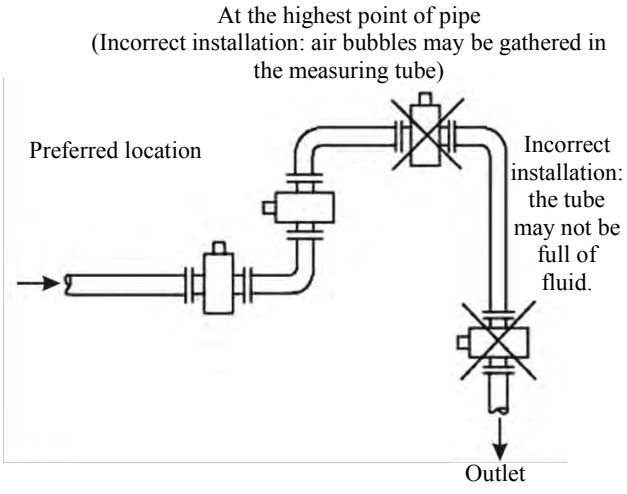
- The grounding rings insulated from the pipe flange must be installed at both ends of the flowmeter. In addition, the grounding rings, flowmeter and grounding cables must be connected to each other.
- Pipe flanges must be connected to each other through copper cables (L) and not connected to the sensor.
- Flange bolts must be insulated (as shown in the figure). Please use the bushings and washers made of insulating materials.

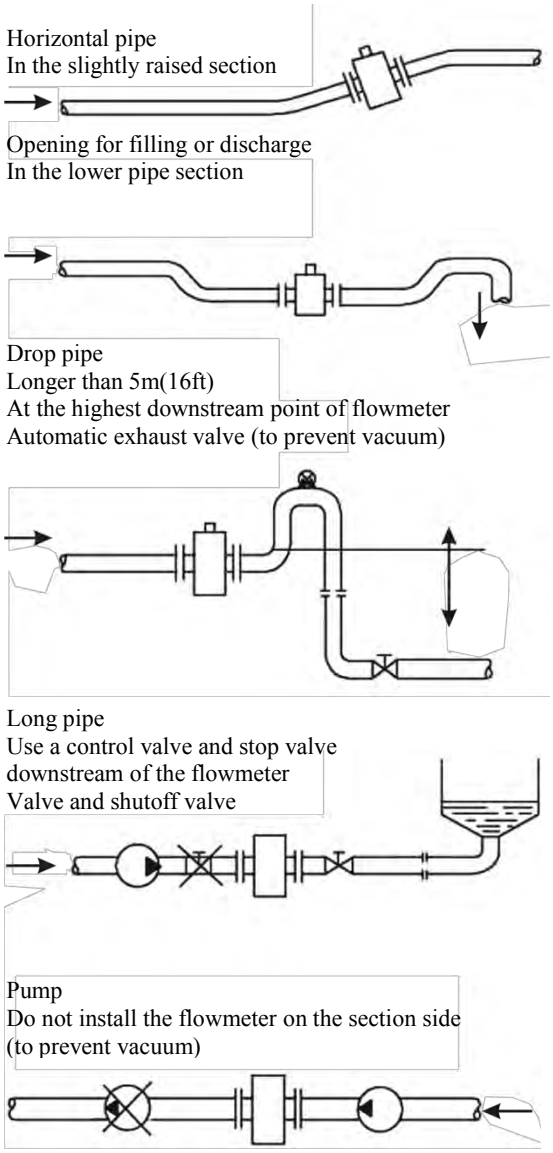


E Grounding ring	3 Sealing ring	6 Nut
1 Sensor flange	4 Pipe flange	7 Gasket
2 Lining	5 Bolt	8 Insulation bushing

Installation location

In order to prevent the PTEE and rubber lining from damage caused by the measurement error and vacuum in the presence of trapped gas, please refer to the following.





The WP-EMF series electromagnetic flowmeter has been tested by the National Quality Inspection and Testing Center for Explosion-proof Products. It complies with relevant requirements of GB/T3836.1-2021 and GB/ T3836.2-2021. It explosion-proof mark is Ex db ia q [ia Ga] ⅡC T6 Gb.

Precautions for use:

- Ambient temperature: -20 ~ +60℃;
- Observe the warning “Open the cover after power-off” on site.
- Keep the enclosure reliably grounded during operation.
- Do not replace parts without authorization.
- Prevent cables of the intrinsically safe explosion-proof system from external electromagnetic interference. Control the cable parameters within 3.0μF/0.39mH.
- Relationship between the explosion-proof temperature group and fluid temperature: T6 -fluid temperature ≤ 80℃.
- Observe relevant requirements of the user manual, Explosive atmospheres - Part 15: Electrical installations design, selection and erection (GB/T3836.15-2017) and Code for design of electrical installations in explosive atmospheres (GB/T50058-2014) during the installation, use and maintenance.

Appendix (Reference Table of Electrode Corrosion Resistance)

Fluid Name / Wetted Part		Electrode material			
		Mo2Ti	Hastelloy C	Tantalum (Ta)	Titanium (Ti)
Perchloric acid	(50%)	N	N	A	B
Phenol	(10%)	B	B	A	
Phosphoric acid	(100%, 20℃)	N	B	A	
Phosphoric acid	(25%, 180℃)	N	B	A	N
Phosphoric acid	(50%, 180℃)	N	B	A	N
Phosphoric acid	(50%, 60℃)	N	B	A	N
Phosphoric acid	(80%, 180℃)	N	B	A	N
Phosphoric acid	(80%, 60℃)	N	B	A	N
Potassium aluminum sulfate	(100%)	B	N	A	A
Potassium carbonate	(100%)	B	B	A	B
Potassium chloride	(50%)	B	N	A	A
Potassium dichromate	(100%)	A	N	A	
Potassium ferricyanide	(100%)	N	N	A	
Potassium ferrocyanide	(100%)	N	N	A	
Potassium bicarbonate	(100%)	B	B	A	
Potassium hydroxide	(25%, 180℃)	N	N	N	N
Potassium hydroxide	(50%, 180℃)	N	N	N	N
Potassium nitrate	(80%)	N	N	B	A
Potassium permanganate	(10%)	N	N	B	B
Potassium persulfate	(10%)	B	B	A	A
Potassium sulfate	(100%)	B	N	A	B
Seawater		N	N	A	A
Silver nitrate	(50%)	N	B	B	B
Sodium acetate	(100%)	N	N	A	A
Sodium borate	(100%)	N	N	A	
Sodium bromide	(100%)	N	N	A	
Sodium carbonate	(100%)	B	B	B	A
Sodium chlorate	(40%)	N	N	A	A
Sodium chlorite	(30%)	N	N	A	B
Sodium chromate	(40%)	N	N	A	A
Sodium cyanide	(100%)	N	N	A	A
Sodium dichromate	(100%)	N	A	A	
Sodium ferricyanide	(100%)				
Sodium fluoride	(100%)	N		N	
Sodium bicarbonate	(100%)	N	N	N	
Sodium bisulfate	(30%)	B	B	A	A
Sodium hydrosulfate	(100%)	N	N	A	A
Sodium hydrogen ferrite	(100%)	B	N	A	
Sodium sulfite	(100%)	N	B	A	
Sodium hydroxide	(100%)	B	B	A	

Continued

Fluid Name \ Wetted Part		Electrode material			
		Mo2Ti	Hastelloy C	Tantalum (Ta)	Titanium (Ti)
Sodium hydroxide	(30%, 180℃)	N	B	N	B
Sodium hydroxide	(40%, 70℃)	B	A	N	B
Sodium hydroxide	(40%, 90℃)	B	A	N	B
Sodium hydroxide	(50%, 180℃)	N	B	N	B
Sodium hypochlorite	(15%)	N	B	A	A
Sodium hypochlorite	(25%)	N	B	B	B
Sodium metaphosphate	(100%)				
Sodium nitrate	(40%)	N	B	A	B
Sodium nitrite	(40%)	N	N	A	A
Tin tetrachloride	(100%)	N	N	A	N
Sulfuric acid	(100%, 60℃)	N	N	A	N
Sulfuric acid	(30%, 180℃)	N	A	A	N
Zinc chloride	(50%)	N	N	A	A
Acetaldehyde	(100%)	B	A	B	A
Acetic acid	(50%)	B	A	A	A
Acetic acid	(75%)	N	A	A	
Vitriol	(100%)	N	N	A	N
Aluminum chloride	(100%)	N	N	B	
Aluminum chlorate	(100%)	N	N	A	N
Aluminum fluoride	(100%)	N	N	N	
Aluminum hydroxide	(100%)	B	N	A	B
Aluminum nitrate	(100%)	N	N	N	B
Aluminum sulfate	(100%)	B	B	A	
Amino sulfuric acid	(100%)	N	N	A	A
Ammonium carbonate	(50%)	N	N	A	B
Ammonium chloride	(30%)	N	B	A	B
Ammonium fluoride	(100%)	N	B	N	
Ammonium bicarbonate	(50%)	N	N	A	N
Ammonia hydrofluorate	(50%)	N	B	N	A
Ammonium hydroxide	(100%)	B	B	N	B
Ammonium nitrate	(100%)	N	B	A	N
Ammonium persulfate	(100%)	N	N	A	
Ammonium phosphate	(100%)	N	N	A	B
Ammonium sulfate	(20%)	N	N	A	
Ammonium sulfide	(100%)			B	
Antimony pentachloride	(100%)	N	N	A	
Antimony trichloride	(100%)	N	N	A	B
Aqua regia	(100%)	N	N	A	
Arsenate acid	(100%)	N	N	A	
Arsenous acid	(100%)	N	N	A	
Barium acetate	(100%)	N	N	A	

Continued

Fluid Name / Wetted Part		Electrode material			
		Mo2Ti	Hastelloy C	Tantalum (Ta)	Titanium (Ti)
Barium carbonate	(100%)	N	N	A	B
Barium chloride	(30%)	N	B	A	N
Barium hydroxide	(50%)	B	N	A	B
Barium sulfate	(100%)	N	N	A	
Barium sulfide	(100%)	N	N	A	
Phenylsulfuric acid	(100%)	N	N	A	
Ammonium borate	(100%)	N	N	A	
Calcium chloride	(100%)	N	N	A	A
Calcium carbonate	(100%)	B	B	A	B
Calcium chlorate	(30%)	N	N	B	B
Calcium chloride	(40%)	N	N	A	
Calcium bisulfate	(100%)	N	N	A	A
Calcium hydroxide	(50%)	N	B	A	A
Sodium silicate	(100%)	N	N	A	
Sodium sulfate	(100%)	N	N	A	B
Sodium sulfide	(100%)	N	N	A	A
Sodium sulfite	(30%)	B	N	A	
Sodium tetraborate	(100%)	B	B	A	A
Sodium thiosulfate	(100%)	N	A	N	A
Calcium hypochlorite	(100%)	N	N	A	
Calcium nitrate	(10%)	N	N	A	
Calcium sulfate	(100%)	N	N	A	
Chloroacetic acid	(100%)	N	B	A	
Chromic sulfuric acid	(50%)	N	B	A	
Chromic acid	(100%)	N	N	A	A
Chromic fluoride	(100%)				
Chromic acid	(50%)	N	N	A	
Chromic sulfate	(100%)	N	B	A	
Copper cyanide	100%	B	B	A	B
Copper fluoride	100%	N	N	N	N
Copper nitrate	50%	N	N	A	B
Copper hydroxide	100%	N	N	N	
Copper sulfate	40%	B	B		B
Copper sulfide	100%	B	B	A	B
Copper chloride	50%	N	N	A	
Ferric chloride	50%	N			
Ferric sulfide	100%		B		
Ferrous chloride	100%	N	N	A	
Ferric nitrate	100%	N	B	A	N
Ferric sulfate	100%	N	N	A	N
Fluoboric acid	100%	N	N	N	

Continued

Fluid Name \ Wetted Part		Electrode material			
		Mo2Ti	Hastelloy C	Tantalum (Ta)	Titanium (Ti)
Silicofluoric acid	40%	N	N	N	
Fluorosulfuric acid	100%	N			N
Formaldehyde	100%	N	B	A	
Formic acid	80%	N	N	A	A
Glacial acetic acid	100%	N	A	A	N
Glycerol (glycerol)	100%	A	A	A	N
Hydrochloric acid	10%, 180℃	N	N	A	
Hydrochloric acid	100%, 20℃	N	N	A	
Hydrosilicofluoric acid	100%	N	B	N	
Hydrosilicofluoric acid	35%	N	B	N	B
Hydrobromic acid	50%	N	N	A	N
Hydrochloric acid	10%, 60℃	N	N	A	
Hydrofluoric acid	98%, 20℃	N	N	N	A
Hydrocyanic acid	100%	B	B	A	
Hydrogen peroxide	50%	B	B	A	
Glycolic acid	35%	B	B	A	N
Glycolic acid	70%	B	B	A	
Hypochlorous acid	20%	N	B	A	
Ferric chloride	100%	N	B	A	A
Ferric nitrate	100%	N	B	A	
Ferric sulfate	100%	N	B	A	
Lead acetate	100%	N	N	A	
Lithium chloride	100%	N	N	B	A
Magnesium chloride	40%	N	N	B	A
Magnesium carbonate	10%	B	B	B	A
Magnesium bisulfate	100%	B	B	B	
Magnesium hydroxide	100%	N	N	N	N
Magnesium nitrate	100%	N	N	N	A
Magnesium sulfate	100%	B	B	N	A
Mercuric chloride	60%	N	N	N	A
Nickel chloride	20%	N	N	N	B
Nickel nitrate	10%	N	N	N	A
Nickel sulfate	100%	N	N	N	A
Nitric acid	10%, 100℃	B	B	A	A
Nitric acid	60%, 100℃	N	N	B	A
Nitric acid	70%, 70℃	N	N	N	A
Nitric acid	98%, 30℃	N	N	N	A
Oxalic acid	100%	N	N	N	A

A: preferred; B: acceptable; C: N/A (for reference only)

Note:1. The maximum fluid temperature is 100℃ unless otherwise specified.

2. The fluids listed in the table are all of single-component type.

Fujian Wide Plus Precision Instruments Co., Ltd.

Electromagnetic Flowmeter Selection Form

Company: _____

Contact: _____

Tel: _____ Fax: _____

Process conditions

Fluid name: _____

Fluid corrosion: _____

Fluid cleanliness: ☐Clean

☐Unclean, with pasty, blocky or solid particles and other impurities

Description:_____; Content:_____;

Ferromagnetic substance content: _____

Fluid conductivity: _____

Measurement range (m^3/h): minimum _____ normal _____ maximum _____

Fluid flow rate (m/s): minimum _____ normal _____ maximum _____

Fluid temperature (℃): minimum _____ normal _____ maximum _____

Fluid pressure (MPa): minimum _____ normal _____ maximum _____

Measurement accuracy: _____%

Installation and environmental conditions

Process pipe OD: _____ Process pipe ID: _____

Process pipe wall thickness: _____ Process pipe material: _____

Installation orientation: ☐Upright ☐Level ☐Others: _____

Pipe vibration: ☐Negligible ☐Violent

Straight pipe section: ☐Length of front straight pipe section:_____ ☐Length of rear straight pipe section:_____

Process connection: ☐Flange standard GB/T9124.1-2019 ☐Other standards: _____

Structural type: ☐Integrated type ☐Cable length between the sensor and converter in the split type: _____

Ambient temperature range: _____

Explosion-proof requirements: ☐Non-explosion-proof ☐Flameproof Ex db ia q[ia Ga] ⅡC T6 Gb

Power supply: ☐220VAC ☐24VDC

Signal output: ☐4 ~ 20mA ☐Frequency pulse

Communication protocol: ☐None ☐RS485 ☐Others

Local display: ☐Instantaneous and cumulative flow

Electrode material: _____ Lining material: _____

Protection level requirements: ☐ IP67 (integrated type) ☐ IP67 (split type) ☐ IP68 (split type)

Confirmation

Model/Specification: _____ Quantity: _____

Confirmed by: _____ Date: _____

Please return it after you select the flowmeter.

WP series products

Intelligent pressure and differential pressure transmitters
Intelligent multi-parameter transmitters
Intelligent temperature transmitters
Electromagnetic | vortex | multi-parameter | orifice | V-type flowmeters...
Radar | ultrasonic level meters
Smart IoT terminals
Intelligent digital instruments

CHPAG series products

High-precision monocrystalline silicon intelligent pressure/differential pressure transmitters
Instrument valve blocks and pipe fittings

Follow it for more details

NO:DC2405

FUJIAN WIDE PLUS PRECISION INSTRUMENTS CO., LTD

Address: No. 16, Xingye West Road, Mawei, Fuzhou, China

Tel: 0591-88023300 88023311

Free technical service hotline: 400-887-6339 800-858-1566

Website: www.wideplus.com Email: info@wideplus.com